Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A holographic recording method comprising the step of projecting a reference beam and an object beam onto a holographic recording medium to form a diffraction grating in a recording layer in the vicinity of a point of intersection of an incident optical axis of the reference beam and an incident optical axis of the object beam, thereby recording information, wherein

the holographic recording medium is rotated in an optical axial plane including the incident optical axes of the reference beam and the object beam in a plurality of stages with respect to the point of intersection while keeping an incident angle of the object beam constant, and the incident optical axis of the reference beam is switched in a plurality of stages synchronously with a rotational angle of the holographic recording medium so as to keep a relative incident angle to the holographic recording medium constant to carry out deflection multiplex recording.

2. (Original) The holographic recording method according to claim 1, wherein

the holographic recording medium is relatively shifted in X and Y axial directions to carry out the deflection multiplex recording and shift multiplex recording, when a rotational central axis of the holographic recording medium represents a Y axis, a direction approximately perpendicular to the recording layer represents a Z axis, and a direction perpendicular to the Y axis and the Z axis represents an X axis.

3. (Original) The holographic recording method according to claim 2 having a process of shifting the holographic recording medium in the X axial direction while keeping the

incident optical axis of the object beam, the incident optical axis of the reference beam, and the rotational angle of the holographic recording medium constant to carry out the shift multiplex recording in the X axial direction, and then a process of shifting the holographic recording medium in the Y axial direction to carry out the shift multiplex recording in the Y axial direction, wherein

whenever the incident optical axis of the reference beam and the rotational angle of the holographic recording medium corresponding thereto are switched, the process of the X axial shift multiplex recording by shifting the holographic recording medium in the X axial direction and the process of the Y axial shift multiplex recording by shifting the holographic recording medium in the Y axial direction are repeated.

4. (Original) The holographic recording method according to claim 2 having a process of shifting the holographic recording medium in the Y axial direction while keeping the incident optical axis of the object beam, the incident optical axis of the reference beam, and the rotational angle of the holographic recording medium constant to carry out the shift multiplex recording in the Y axial direction, and then a process of shifting the holographic recording medium in the X axial direction to carry out the shift multiplex recording in the X axial direction, wherein

whenever the incident optical axis of the reference beam and the rotational angle of the holographic recording medium corresponding thereto are switched, the process of the Y axial shift multiplex recording by shifting the holographic recording medium in the Y axial direction and the process of the X axial shift multiplex recording by shifting the holographic recording medium in the X axial direction are repeated.

5. (Original) The holographic recording method according to claim 2 having a process of shifting the holographic recording medium in the X axial direction while keeping the incident optical axis of the object beam, the incident optical axis of the reference beam, and

the rotational angle of the holographic recording medium constant to carry out the shift multiplex recording in the X axial direction,

a process of switching the incident optical axis of the reference beam and the rotational angle of the holographic recording medium corresponding thereto and the process of the Y axial shift multiplex recording by shifting the holographic recording medium in the Y axial direction are repeated.

6. (Original) The holographic recording method according to claim 2, wherein:

the recording layer is partitioned into a plurality of hologram blocks in the X axial direction and the Y axial direction; and

in each of the hologram block, a process of X axial shift multiplex recording by shifting the holographic recording medium in the X axial direction while keeping the incident optical axis of the object beam, the incident optical axis of the reference beam and the rotational angle of the holographic recording medium constant and a process of Y axial shift multiplex recording by shifting the holographic recording medium in the Y axial direction are carried out, and whenever the incident optical axis of the reference beam and the rotational angle of the holographic recording medium corresponding thereto are switched, the process of the X axial shift multiplex recording by shifting the holographic recording medium in the X axial direction and the process of the Y axial shift multiplex recording by shifting the holographic recording medium in the Y axial direction are repeated.

7. (Original) A holographic recording apparatus comprising: a laser light source; a beam splitter for splitting a laser beam from the laser light source into a reference beam and an object beam; a reference optical system for guiding the reference beam into a holographic recording medium; and an object optical system for guiding the object beam into the holographic recording medium, wherein

the reference optical system comprises

a rotating mirror for selectively reflecting the reference beam from the direction of the beam splitter into a plurality of different optical path directions,

a lens group for guiding the reference beam in the plurality of different optical paths to an intersection point with the object beam in the vicinity of the holographic recording medium via corresponding different incident optical axes,

a rotating stage for supporting the holographic recording medium rotatably with respect to a Y axial direction passing through the intersection point and perpendicular to an optical axial plane including each of the incident optical axes of the reference beam and the object beam, and

a control device for synchronously controlling the rotating mirror and the rotating stage so as to keep a relative incident angle of the reference beam from each incident optical axis to the holographic recording medium constant corresponding to the plurality of different optical paths of the reference beam.

8. (Original) The holographic recording apparatus according to claim 7 further comprising:

a translational stage for supporting the rotating stage so as to shift it in an X axial direction and the Y axial direction, when a direction in the optical axial plane and approximately perpendicular to a recording layer of the holographic recording medium represents a Z axis and a direction perpendicular to the Y axis and the Z axis represents an X axis, the translational stage being able to be controlled synchronously with the rotating mirror and the rotating stage by the control device.

9. (Original) A holographic recording medium in which information is recorded by a diffraction grating formed in a recording layer in the vicinity of an intersection point between an incident optical axis of a reference beam and an incident optical axis of an object beam by projecting the reference beam and the object beam thereonto, wherein

the diffraction gratings are recorded by deflection multiplex recording so that a plurality of diffracted light beams generates in different directions when a reproduction reference beam is applied at an incident angle of the incident optical axis of the reference beam at the time of recording.

10. (Original) The holographic recording medium according to claim 9, wherein

when a direction in the optical axial plane and perpendicular to an optical axial plane including the incident optical axes of the reference beam and the object beam and also passing through the intersection point represents a Y axis, a direction approximately perpendicular to the recording layer represents a Z axis, and a direction perpendicular to the Y axis and the Z axis represents an X axis,

the diffraction gratings recorded by the deflection multiplex recording are in positions successively shifted in the X and Y directions.

11. (Original) The holographic recording medium according to claim 10, wherein

the recording layer is partitioned into a plurality of hologram blocks in the X axial direction and the Y axial direction, and

in each of the hologram blocks, the diffraction gratings recorded by the deflection multiplex recording are in positions successively shifted in the X and Y directions.

12. (Currently Amended) A method for reproducing a holographic memory comprising the steps of:

projecting a reproduction reference beam onto the holographic recording medium according to ~~any one of claims 9 to 11~~claim 9 at an incident angle of an incident optical axis of a reference beam at the time of recording, and allowing imaging devices to individually receive a plurality of generating diffracted light beams to reproduce a plurality of signals at the same time.

13. (Currently Amended) A holographic memory reproducing apparatus comprising:

a stage for supporting the holographic recording medium according to ~~any one of claims 9 to 11~~claim 9;

a laser light source; and

a reproduction reference optical system for guiding a reproduction reference beam being a laser beam from the laser light source into the holographic recording medium at an incident angle of an incident optical axis of the reference beam,

wherein, the reference optical system comprises:

a rotating mirror for selectively reflecting the reference beam from the direction of the beam splitter into a plurality of different optical path directions,

a lens group for guiding the reproduction reference beam to an intersection point with the object beam in the vicinity of the holographic recording medium via the incident optical axes of the reference beam, and

a plurality of imaging devices provided corresponding to a plurality of diffracted light beams generating from the holographic recording medium by projecting the reproduction reference beam, for receiving the corresponding diffracted light and reproducing signals.

14. (Original) The holographic memory reproducing apparatus according to claim 13, wherein

the stage is a translational stage for supporting the holographic recording medium so as to shift in an X axial direction and a Y axial direction, when a direction in the optical axial plane and approximately perpendicular to a recording layer of the holographic recording medium represents a Z axis and a direction perpendicular to the Y axis and the Z axis represents an X axis.

15. (New) A method for reproducing a holographic memory comprising the steps of:

projecting a reproduction reference beam onto the holographic recording medium according to claim 10 at an incident angle of an incident optical axis of a reference beam at

the time of recording, and allowing imaging devices to individually receive a plurality of generating diffracted light beams to reproduce a plurality of signals at the same time.

16. (New) A method for reproducing a holographic memory comprising the steps of:

projecting a reproduction reference beam onto the holographic recording medium according to claim 11 at an incident angle of an incident optical axis of a reference beam at the time of recording, and allowing imaging devices to individually receive a plurality of generating diffracted light beams to reproduce a plurality of signals at the same time.

17. (New) A holographic memory reproducing apparatus comprising:

a stage for supporting the holographic recording medium according to claim 10;

a laser light source; and

a reproduction reference optical system for guiding a reproduction reference beam being a laser beam from the laser light source into the holographic recording medium at an incident angle of an incident optical axis of the reference beam,

wherein, the reference optical system comprises:

a rotating mirror for selectively reflecting the reference beam from the direction of the beam splitter into a plurality of different optical path directions,

a lens group for guiding the reproduction reference beam to an intersection point with the object beam in the vicinity of the holographic recording medium via the incident optical axes of the reference beam, and

a plurality of imaging devices provided corresponding to a plurality of diffracted light beams generating from the holographic recording medium by projecting the reproduction reference beam, for receiving the corresponding diffracted light and reproducing signals.

18. (New) A holographic memory reproducing apparatus comprising:

a stage for supporting the holographic recording medium according to claim 11;

a laser light source; and

a reproduction reference optical system for guiding a reproduction reference beam being a laser beam from the laser light source into the holographic recording medium at an incident angle of an incident optical axis of the reference beam,

wherein, the reference optical system comprises:

a rotating mirror for selectively reflecting the reference beam from the direction of the beam splitter into a plurality of different optical path directions,

a lens group for guiding the reproduction reference beam to an intersection point with the object beam in the vicinity of the holographic recording medium via the incident optical axes of the reference beam, and

a plurality of imaging devices provided corresponding to a plurality of diffracted light beams generating from the holographic recording medium by projecting the reproduction reference beam, for receiving the corresponding diffracted light and reproducing signals.

19. (New) The holographic memory reproducing apparatus according to claim 17, wherein

the stage is a translational stage for supporting the holographic recording medium so as to shift in an X axial direction and a Y axial direction, when a direction in the optical axial plane and approximately perpendicular to a recording layer of the holographic recording medium represents a Z axis and a direction perpendicular to the Y axis and the Z axis represents an X axis.

20. (New) The holographic memory reproducing apparatus according to claim 18, wherein

the stage is a translational stage for supporting the holographic recording medium so as to shift in an X axial direction and a Y axial direction, when a direction in the optical axial plane and approximately perpendicular to a recording layer of the holographic recording

medium represents a Z axis and a direction perpendicular to the Y axis and the Z axis represents an X axis.